



**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

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Order Instituting Rulemaking to Implement to  
establish the California Institute for Climate  
Solutions.

Rulemaking 07-09-008

**OPENING COMMENTS OF PACIFIC GAS AND  
ELECTRIC COMPANY (U 39 E) ON PROPOSED  
CALIFORNIA INSTITUTE FOR CLIMATE SOLUTIONS**

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## TABLE OF CONTENTS

	Page
I. INTRODUCTION .....	1
II. EXECUTIVE SUMMARY .....	1
III. RESPONSES TO SPECIFIC QUESTIONS.....	4
A. Question 1: Is There a Need for the Kinds of Research and Educational Programs Outlined in the Proposal? .....	4
B. Question 2: Is the Budget Identified in the UC Proposal Reasonable Given the Goals of the Institute? .....	4
C. Question 3: Is an Equal Cents Per Kilowatt Hour and/or Equal Cents Per Therm Rate Mechanism the Appropriate Way to Distribute the Costs of Funding the Proposed Institute?.....	5
D. Question 4: Are There Other Sources, Public or Private, that Should Help Fund the Institute?.....	7
E. Question 5: How Should Funds Be Allocated Between Administration and Technological Research, Public Policy Research, and Educational Programs? .....	8
F. Question 6: How Should the Proposed Governance be Structured so that the Commission Maintains Enough Control to Ensure that Ratepayer Funds are Allocated so as to Maximize Ratepayer Benefits?.....	12
G. Question 7: What Performance Measures or Other General Guidelines Should be Placed on Funding to Ensure that Funds are Used Efficiently and in a Manner that Maximizes Ratepayer Benefits? .....	13
H. Question 8: What Should be the Precise Role of the Proposed Stakeholder Committee in Relation to the Proposed Steering Committee? .....	14
I. Question 9: Does the Proposed Institute Relate to or Complement Other Publicly Funded Research Programs and Facilities Such as PIER, Helios, or the Energy Biosciences Institute?.....	15
J. Question 10: What Additional Priority Program Areas For Research and Education Should be Added to Those Outlined in the UC Proposal? .....	18
K. Question 11: Should CICS be Expanded to Include Participation by Other Public or Private Institutions? .....	19
L. Question 12: If Research Conducted by the Institute Results in Profitable Technologies or Patents, Should Some Portion of the Profits be Used to Reimburse Ratepayers for the Cost of the Research? If So, How Should This be Structured? .....	19

**TABLE OF CONTENTS**  
**(continued)**

	<b>Page</b>
IV. CONCLUSION.....	21

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to establish the  
California Institute for Climate Solutions.

Rulemaking 07-09-008

**OPENING COMMENTS OF PACIFIC GAS AND  
ELECTRIC COMPANY (U 39 E) ON PROPOSED  
CALIFORNIA INSTITUTE FOR CLIMATE SOLUTIONS**

**I. INTRODUCTION**

Pursuant to Ordering Paragraph 5 of Rulemaking 07-09-008 (OIR), Pacific Gas and Electric Company (PG&E) provides its opening comments on the University of California's proposal to establish the California Institute for Climate Solutions (Institute). PG&E's comments are organized into (1) an executive summary; and (2) responses to each of the 12 questions posed by the OIR.

**II. EXECUTIVE SUMMARY**

PG&E supports the University of California's proposal to establish the Institute, subject to the modifications discussed in more detail below. The Institute is a bold, innovative approach to climate research and solutions, and continues California's national and international leadership on one of the most important public policy issues of our time. Further, if properly structured, the Institute has the potential to provide significant public and customer benefits in accelerating applied research, development and transfer of clean energy and new customer-side technologies to reduce greenhouse gas emissions and to mitigate and adapt to physical climate changes.

As we discuss below, the proposal for the Institute can be improved and adapted to ensure clear policy and program guidance and to provide mechanisms and accountability for translating and transferring benefits of Institute-funded R&D to electric and gas utility customers. In addition, the scope of the Institute's R&D program should focus on applied research and technology transfer, with potential direct benefits

to energy utility customers, and avoid duplication with other R&D programs in the federal, state and private sectors.

The key modifications PG&E recommends the Commission and University of California consider are:

- Provide a clear path for electric and gas utility customers to benefit from their investment in the Institute's programs, by incorporating "benefit-sharing" mechanisms that provide free access to and licensing of technologies, information and research results generated by the Institute, as well as royalties in the revenues and value generated by patents and licenses granted by the Institute to third parties.
- Provide for funding and participation in the Institute by California's publicly-owned utilities, either through voluntary participation or through legislation, so that the one-third of California consumers and businesses who are served by publicly-owned utilities will have an opportunity to participate and benefit in the Institute's programs.
- Provide for fair, current, and full cost recovery mechanisms for funding the Institute's budget through electric and gas utility rates charged by the utilities participating in the Institute.
- Focus the Institute on pure and applied research, development and transfer of non-carbon emitting energy supply and "second generation" energy efficiency technologies in the electric and natural gas sectors, including cutting-edge "smart" technologies in the distribution and transmission of electricity and gas, as well as on strategies for mitigating the physical impacts of climate change on specific electric and gas facilities and infrastructure. Education programs should be limited to training of workers, engineers, scientists and other technology experts in the new energy supply and efficiency technologies, and public policy

research and outreach should be excluded from the scope of the Institute's programs, given the multitude of public and private sector entities already engaged in those activities. Unless there is a direct tie in to the gas or electric utility sectors, research on non-carbon emitting technologies in other sectors of the economy, such as the transportation sector, should be excluded from the scope of the Institute's programs, until those sectors provide direct funding for those programs.

- Coordinate the research program of the Institute with other public and private institutions already performing similar research, such as the California Energy Commission's PIER programs; the US Department of Energy's R&D and national research laboratory programs; and programs at other public and private universities.
- Open up the Institute to participation by other public and private California research institutions, including the California state university system and private universities in order to ensure as robust and dynamic a research program as possible.
- Provide a streamlined and efficient governance structure in which the sources of funding—utility customers—are represented on the Governance Board and other decision-making committees through the CPUC and the investor-owned utilities, and advisory committees are focused and avoid duplication of effort.

PG&E commends the Commission and the University of California for demonstrating the bold and dramatic global leadership and creativity inherent in the proposal to establish the Institute. We look forward to helping make the Institute a functioning reality as soon as possible. Our responses to the Commission's specific questions are provided below.

### **III. RESPONSES TO SPECIFIC QUESTIONS**

#### **A. Question 1: Is There a Need for the Kinds of Research and Educational Programs Outlined in the Proposal?**

##### **PG&E RESPONSE:**

Yes, subject to potential adjustments identified in these comments to optimize the scope of the programs funded by the Institute. PG&E applauds the Commission's effort to develop public policies that help accelerate the technology advancements that are needed to achieve California's and the world's aggressive greenhouse gas reduction goals. We support the creation of the Institute to conduct mission-oriented applied research, development (R&D) and to rapidly transfer the knowledge gained to the electric and gas sector for implementation. We agree that the University of California system, along with other research and academic institutions within the state, provide the rich intellectual capital to draw upon for this work. Thus, in order to engage the best available talent, we recommend that the University and the Commission in the future expand the Institute to proactively solicit and/or recruit competitive proposals and participation from other California institutions such as the California state universities and other private and public institutions.

In the response to Question 5, PG&E provides more detail on the types and scope of research that the Institute should undertake.

#### **B. Question 2: Is the Budget Identified in the UC Proposal Reasonable Given the Goals of the Institute?**

##### **PG&E RESPONSE:**

Yes. The overall budget appears more than adequate for the proposed activities (assuming that the Institute will be leveraging available funding from other sources). We recommend that the University of California identify and describe with more detail how the proposed funding (particularly for the Research and Education Program component) would be broken down into more discrete research categories, and how the

funding could be leveraged with other sources of federal, state and private partnership funding.

**C. Question 3: Is an Equal Cents Per Kilowatt Hour and/or Equal Cents Per Therm Rate Mechanism the Appropriate Way to Distribute the Costs of Funding the Proposed Institute?**

**PG&E RESPONSE:**

No. PG&E believes there is a more appropriate cost allocation method than “equal cents per kilowatt hour or therm” that is better aligned with the way similar social program costs are allocated among customers. Social program costs are defined as social, environmental and public purpose programs that advance desirable social goals where a substantial portion of the benefits of the program accrue to society rather than to a particular class of electric or gas customers. Such programs are largely independent of usage (electric kilowatt hours or gas therms), which is the basis for an equal cents per kilowatt hour or therm allocation. PG&E believes the costs of funding the proposed institute should be allocated using the currently adopted energy efficiency (EE) funding method. The EE allocation method could apply both at the utility level, among electric and/or gas departments, and among the customer classes served by the electric and/or gas utilities. Institute funding would be allocated among utilities and between gas and electric commodity based on the respective test year revenue requirements for EE programs.

PG&E recommends that the electric portion of the Institute costs be allocated among the electric customer classes on an equal percent of total revenue (with a generation amount imputed for direct access customers). This method of allocation is used for all EE program costs, as well as for distributed generation incentive costs. For example, non-CARE portions of Public Purpose Program revenue requirements are allocated based on an equal percent of total revenue basis. These programs include, for

example, Renewables; Research, Development and Demonstration; EE;<sup>1/</sup> Low Income EE; and Procurement EE. In addition, the California Solar Initiative, the Self Generation Incentive Program and the costs of PG&E's Climate Protection Tariff will be allocated based on equal percent of total revenue beginning January 1, 2008, and included in distribution rates for recovery consistent with current practice.<sup>2/</sup>

PG&E believes that the functions of the Institute are more closely associated with the initiatives discussed above, and thus should be allocated on an equal percent of revenue, compared to the functions that are currently allocated on an equal cents per kWh basis. Programs currently allocated among customers on an equal cents per kWh basis include the costs of the CARE program, the DWR bond charge, the Energy Cost Recovery Amount and nuclear decommissioning costs. Accordingly, PG&E recommends that the Commission adopt the allocation approach used for energy efficiency and distributed generation incentive costs: *equal percent of total revenue*. To facilitate implementation, PG&E also requests that these funds be allocated on a one-time basis based on equal percent of revenue and included with other distribution revenue. Thereafter, changes to Institute funding would be allocated with other distribution revenue changes based on equal percent of distribution revenue consistent with the allocation of funding for the Self Generation Incentive Program, the California Solar Initiative, and the Climate Protection Tariff.

PG&E proposes the gas portion of Institute costs be allocated among gas customer classes based on the currently adopted allocation method for gas energy efficiency costs. This method currently applies to the allocation of gas energy efficiency and low income energy efficiency program funding.

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<sup>1/</sup> Renewables, Research, Development and Demonstration and EE program funding and cost allocation is subject to rate caps under PUC Code Section 399.8 c 2, but were established as equal percent of revenue initially.

<sup>2/</sup> The allocation of these components changes effective January 1, 2008, in the manner approved by D.07-09-004.

**D. Question 4: Are There Other Sources, Public or Private, that Should Help Fund the Institute?**

**PG&E RESPONSE:**

Yes. In order to maximize the effectiveness of the Institute, California investor-owned utility customers should not be the only source of the funding. Because the Institute's research is expected to benefit all California electric and gas utility customers, publicly owned utilities should also participate in the funding of the Institute. Likewise, the scope of the Institute should only be expanded to include research that benefits other sectors, e.g. the transportation sector, if appropriate funding and participation from those sectors is involved. In order to provide for participation by the publicly owned utilities and transportation-related entities, a broader legislation authorization should be considered. In addition, to ensure utility customer funds are expended cost effectively, the Institute's funding guidelines should include awarding additional credit to projects that leverage existing public/private funding in the selection process.

The Commission and University of California should also take into account the recommendations of the California Air Resources Board's (ARB) Global Warming Economic and Technical Advancement Advisory Committee (ETAAC), which is in the process of developing recommendations to "advise (ARB) on activities that will facilitate investment in and implementation of technological research and development opportunities including, but not limited to, identifying new technologies, research, technology transfer projects, funding opportunities, developing state, national, and international partnerships and technology transfer opportunities, and identifying and assessing research and advanced technology investment and incentive opportunities that will assist in the reduction of greenhouse gas emissions." Some of the recommendations being considered by ETAAC include using revenues from auctioning of GHG allowances or a tax on GHG emissions to fund technology research and innovation.

**E. Question 5: How Should Funds Be Allocated Between Administration and Technological Research, Public Policy Research, and Educational Programs?**

**PG&E RESPONSE:**

PG&E believes that the Institute's scope should be focused on pure and applied research into utility sector supply and advanced end-use technologies, and not on public policy development. We recommend that the bulk of Institute funds be directed to research in energy supply sources and end-use technologies, because this is an area where utility customers could potentially reap the greatest and/or most immediate benefits. As an example of how funding might be allocated among pure and applied research, the R&D funds could be divided into 55% basic research, 20% applied research, with the heavy emphasis on basic research helping to bridge the "funding gap" commonly observed for R&D in this area. The final 25% could be split: 10% worker training, 10% forecasting and modeling of physical climate changes, and 5% administration. An allocation formula such as this should assist in seeding high risk research and stimulate the growth of California businesses that address the climate change issue.

In order to maximize the benefits of the Institute's research program, we recommend the following specific priorities:

**1. The Institute should give priority to R&D work in the electric and natural gas sector that benefits the customers of California utilities who contribute to the Institute's funding, rather than other sectors such as the transportation sector.** This is appropriate because, to the extent that the Institute is solely funded by customers of California investor owned utilities, the Institute should focus on research, development and technology transfer projects that provide more immediate benefits to the customers of those utilities. However, this does not preclude a broad-based research program whose benefits and scope cut across both the utility and non-utility sectors. For example, the Institute could support R&D on plug-in hybrid and electric vehicles that

would benefit utility customers as well as the transportation sector. On the other hand, research into biofuels or other technologies that have application only outside the electric and gas sector, should not be within the Institute's scope.<sup>3/</sup>

**2. The Institute's research should avoid and minimize duplication with other programs in the federal, state and private sectors.** As discussed in more detail in the response to Question 9, a host of federal, state and private programs exist currently that are conducting climate solution related research and development work, and therefore the Institute should carefully coordinate the development of its research program in order to avoid duplicating those programs. Coordination among funding programs is essential. (See response to Question 9 below.)

**3. In the area of building and home energy efficiency and conservation,** the University of California proposes that the Institute play a role in increased energy efficiency by focusing on improving building codes, advancing end-use technologies, and allowing customers to take advantage of real-time monitoring. PG&E appreciates that long-term climate solutions will include building and appliance codes and standards and real-time energy information technologies. However, **in order to have significant impact in the building and land use efficiency area, PG&E recommends that the Institute focus its efforts on advanced end-use technologies,** what the University of California calls the 'second revolution' of energy efficiency, including battery technology, solid state lighting, power storage, and energy-oriented nanotechnology. In this regard, the Institute would need to work closely with the California Energy

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<sup>3/</sup> For example, the Energy Biosciences Institute at UC Berkeley is already being funded by BP at \$500 million over ten years to conduct research on biological processes for several aspects of energy production, such as production of biofuels, mechanism for biological sequestration of carbon dioxide, biological processing of fossil fuels and microbially-enhanced oil recovery. The Joint Bioenergy Institute – a partnership among Lawrence Berkeley National Laboratory, Sandia National Laboratories, UC Berkeley, UC Davis, Stanford University, and Lawrence Livermore National Laboratory – was recently selected by DOE as one of three new research centers focusing on the science for biofuel production funded at up to \$125 million over a period of five years.

Commission's (CEC's) Public Interest Energy Research (PIER) Program and the utilities to determine specific R&D priorities and to avoid duplication.

Conversely, **because of the already active roles of the CPUC, CEC, industry, and other stakeholders, PG&E does not recommend that the Institute focus on improving building codes or implementation of real-time customer metering and monitoring technologies. However, projects that enhance the efficiency and reliability of the distribution and transmission grid, e.g. "Smart Grid" technologies, should be eligible for funding.** The utilities through the CPUC's Energy Efficiency program and CEC are actively engaged with local governments on building and appliance codes and will be even more so in the future. The utilities also already have begun deploying real-time monitoring devices and other advanced energy usage information technologies to encourage conservation. However, additional R&D on advanced transmission and distribution technologies that could enhance reliability and provide more energy efficient delivery of energy services, e.g. "Smart Grid" and other distribution automation technologies, is needed. Therefore, such "Smart Grid" and other distribution automation research and pilot projects should be within the scope of the Institute's programs. PG&E is hopeful that the 'second revolution' advanced energy efficiency and "Smart Grid" technology created by the Institute will work with and supplement these real-time monitoring technologies rather than duplicate them.

**4. In the area of education and public outreach,** the University of California proposes that the Institute play a role in developing and distributing educational materials, and engage stakeholders and user groups to ensure high-priority climate change goals are being achieved. **Because there already are many entities, ranging from the utilities to the Department of Energy (DOE), CPUC and CEC, involved in development of educational and outreach materials, PG&E recommends that the Institute not duplicate those existing efforts, but instead develop educational and training materials, including engineering, science and technology scholarship**

**programs, for the utility and energy workforce** that is needed now to achieve future goals and targets for converting and retooling the economy to a non-carbon emitting framework. The University of California and other California institutions have world-class educational facilities that can and should help structure curriculums and training for the workforce of the future needed to address climate and energy-related issues.

**5. In the area of climate modeling and climate change mitigation**, much work already is being and has been done on large scale analyses that are global in perspective. However, there has been limited modeling and mitigation planning at a small enough scale appropriate for risk analysis and adaptation for use by installed energy facilities and infrastructure. **The work of the Institute should go beyond the existing global modeling and analyses and focus on developing results that are granular enough to support future utility operations, planning, and investment decisions** that need to be made on long lead times to changing climate and physical conditions. Additionally, it will be very useful for the Institute to research and document the baselines on current conditions needed to measure incremental and other changes in the environment that can and will affect utility facilities. The Institute's modeling efforts also can establish agreed-upon triggers, based on monitoring results, which would allow advanced planning by utilities and other infrastructure owners to implement pre-determined adaptation measures far enough in advance of the forecast climate changes. An example of this would be increased sediment monitoring which could lead to specific pre-authorized investments in sediment removal and watershed management for hydroelectric generating facilities.

Another important area of research should focus on adapting utility operating systems and equipment to enable them handle extreme heat, increased sea level, altered river flows, or other climate conditions that the modeling predicts and monitoring verifies. Here, partnering with other R&D efforts, including co-funding strategies, with DOE, CEC, EEI, AGA, EPRI and other research organizations, would leverage on

existing expertise and will help make the research as useful as possible to utility customers while avoiding duplication of effort.

**6. Because many public and private entities already are actively engaged in public policy making and dissemination, PG&E recommends that the scope of the Institute not include public policy making and dissemination.** Instead, the Institute should focus on the pure and applied R&D that can and should lead to technology breakthroughs and cost-effective climate change mitigation measures that can be rapidly and efficiently transferred to the public and private sectors on their own merits, without the need to public policy debate.

**F. Question 6: How Should the Proposed Governance be Structured so that the Commission Maintains Enough Control to Ensure that Ratepayer Funds are Allocated so as to Maximize Ratepayer Benefits?**

**PG&E RESPONSE:**

Because the customers of the investor-owned utilities are currently the only contributors contemplated for the Institute's funding, the governance structure for the Institute should ensure that the research program and projects are undertaken for the benefit of those customers. For this reason, the CPUC and the California investor-owned utilities as supervisors and stewards of the use of funds collected from utility customers, should be represented on the Governing Board and the steering committees, in order to represent customers on the Institute's strategic planning, research priorities and project funding decisions. In addition, the CPUC and utilities, with their extensive knowledge and experience in emerging technology and renewable energy procurement, can and should lend expertise in the selection of projects that will ultimately lead to the greatest payoffs in customer and societal benefits.

**G. Question 7: What Performance Measures or Other General Guidelines Should be Placed on Funding to Ensure that Funds are Used Efficiently and in a Manner that Maximizes Ratepayer Benefits?**

**PG&E RESPONSE:**

We recommend that the Commission establish clear accountability, including periodic audit and reporting requirements, regarding how utility customer funds are allocated and spent by the Institute. In addition to CPUC and utility representation on the Governing Board of the Institute, we recommend that the reporting and oversight process include, at a minimum, the following:

1. **Annual Financial Reports:** The Financial Report should clearly outline the Institute's budget and expenditures, including funding from other public and private sources or royalties collected, and how expenditures are allocated to the various program areas. The Institute must maintain an accounting system and supporting fiscal records to assure that funds awarded are used solely for the purpose designated.
2. **Annual Program Report:** The Annual Program Report should describe the progress and activities of funded programs. In addition, the Annual Program Report should list all inventions, patents, and licensing agreements that resulted from the funded program(s).
3. **Program Review:** The Governing Board and Steering Committee, with the assistance from the External Advisory Board, should conduct a program review every three years to assess the Institute and determine whether the Institute should continue and/or whether the Institute's funding/research objectives should be redirected. We recognize that R&D is a long term process that may not deliver immediate results, and that there needs to be some tolerance for occasional failures as an acceptable cost of the innovation process. Nevertheless, the Governing Board and Steering Committee must have a means of reassessing

the Institute and its programs periodically and then to terminate or redirect the programs and projects that do not demonstrate potential to deliver benefits to customers and society. The three-year program review should be followed by a revised Strategic Plan.

**H. Question 8: What Should be the Precise Role of the Proposed Stakeholder Committee in Relation to the Proposed Steering Committee?**

**PG&E RESPONSE:**

PG&E believes that there should be clear organizational lines between the governing and advisory bodies of the Institute. In this regard, PG&E recommends that the Steering Committee should be a formal standing committee of the Governing Board, and include representatives from the UC and partner institutions, the funding utilities and distinguished subject-matter experts. The Steering Committee should be responsible for developing and recommending the following to the Governing Board:

- A 3-5 year Strategic Plan and periodic updates, with input from Stakeholder Committee
- Budget allocation
- Annual and longer-term R&D agenda consistent with the Strategic Plan, including demonstrating that research programs have been coordinated with other R&D programs in order to avoid overlap and duplication
- Proposal review and selection, with advice from the Program Council
- Criteria for overall evaluation of the programs
- Annual progress review of the Institute's achievement toward goals, including assessment of customer benefits and whether or not the Institute has succeeded in having broad participation by researchers and other institutions
- Program review and specific program revisions, redirection or other

process changes that will improve the overall quality of the program, in conjunction with a single external advisory committee, as discussed below.

The Governing Board should consider and adopt, modify or reject the Steering Committee's recommendations through the normal governance process.

The Stakeholder Committee should be configured to take on in a comprehensive fashion all the expert and public advisory functions needed to guide the Institute, and should include representatives from other public and private education and research institutions, advocacy groups, environmental organizations, related industries, and other interested stakeholders. The Stakeholder Committee should be responsible for the following:

- Advising the Steering Committee and Governing Board on the development of the Strategic Plan and R&D agenda
- Providing advice on how to increase participation by other public and private institutions, and encourage and leverage funding from public/private partnerships
- Providing advice and market perspective on how to adapt and transfer research finding for implementation
- Serving as an all-purpose expert advisory group to provide advice on technical or policy matters upon request

**I. Question 9: Does the Proposed Institute Relate to or Complement Other Publicly Funded Research Programs and Facilities Such as PIER, Helios, or the Energy Biosciences Institute?**

**PG&E RESPONSE:**

Yes. The proposed Institute relates to and may complement other publicly funded research programs. However, as discussed in the responses to questions above, there are also many risks for overlap and duplication with other R&D programs.

For example, the CEC's PIER program provides \$62.5 million annually in various R&D areas, some of which overlaps with the proposed Institute.<sup>4/</sup> The CEC also administers the public interest research and development component of the natural gas surcharge at \$50 million annually. The SB 1 California Solar Initiative, administered by the CPUC, provides up to \$50 million for R&D related to solar technologies and distributed generation technologies that employ or could employ solar energy for generation, storage of electricity or to offset natural gas usage. In addition, federal funding is also available through various US Department of Energy initiatives.<sup>5/</sup> The Helios Project is a combined initiative of the University of California at Berkeley and the Lawrence Berkeley National Laboratory designed to accelerate scientific breakthroughs and technological advances for the development of new carbon-neutral fuels. The group has now expanded to include scientists from UC Davis, Caltech, MIT, the US Department of Agriculture and Stanford University.

Furthermore, other public/private partnerships currently exist at UC Berkeley (the Energy Biosciences Institute funded by BP at \$500 million over ten years) and Stanford University (Global Climate and Energy Project, sponsored by Toyota, EG,

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<sup>4/</sup> The PIER Program includes the following program areas: Buildings End-Use Energy Efficiency, Climate Change Program, Energy Innovations Small Grant Program, Energy-Related Environmental Research, Energy Systems Integration, Environmentally-Preferred Advanced Generation, Industrial/Agricultural/Water End-Use Energy Efficiency, Natural Gas Research, Renewable Energy Technologies, Transportation Research.

<sup>5/</sup> For example, the DOE Wind and Hydropower Technologies Program recently released a call for proposals to solve industry's key questions in utility-scale wind and, subject to FY08 Congressional Appropriations for an Ocean Energy Program, ocean energy technologies. This program has budgeted approximately \$1 million for in kind laboratory-based technical support and expects to budget additional funding next fiscal year for additional proposals calls. DOE also supports technology commercialization through programs such as its loan guarantee program to encourage early commercial use in the United States of new or significantly improved technologies in energy projects. The DOE also has programs targeted at small businesses such as its \$102 million Small Business Innovation Research (SBIR) Program, which funds energy related projects such as fuel cell and solar roofing tiles. Last but not least, a complete list of past and currently open solicitations by DOE's Office Energy Efficiency and Renewable Energy (EERE) for development and demonstration projects can be found at <http://www1.eere.energy.gov/financing/>.

ExxonMobil, and Schlumberger and funded at \$225 million over ten years and conducts fundamental, pre-commercial research on developing energy systems and technologies that reduce GHG emissions.) Finally, there are also commercialization programs within the state such as the ARB's Innovative Clean Air Technologies Program funded at \$1 million per year, as well as are South Coast AQMD's Technology Advancement Program funded at \$9-15 million per year<sup>6/</sup>, to name only a few.

Because the risk of duplication and overlap in these various climate change-related programs is so high, we recommend that the Institute be required to coordinate with other existing programs in order to maximize program cost effectiveness and benefits to utility customers. The Institute should include a formal process for coordinating its research strategies as part of its strategic planning and governance process. The Institute should give priority to R&D work that is not currently done elsewhere or can be better done through the Institute. The Commission should require the Institute to coordinate with other local, regional and national research efforts to leverage research efforts, including entering into a formal memorandum of understanding with other key R&D program managers in order to avoid duplication and competition in funding and research priorities.

Moreover, in order to ensure coordination and optimal cost sharing among different programs, the research programs funded by the Institute should seek a nominal percentage of cost share (greater than 15%) from industry and other public and private funding sources. This guideline would serve as a validation to utility customers that their funds are being utilized appropriately where industry supports the research proposed as viable in addressing a discrete need. In addition, the ability to obtain financial support from other sources outside of the Institute reduces the financial and

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<sup>6/</sup> The SCAQMD's program is a public/private partnership which typically leverages its public funds with an average of \$3 from outside sources for every dollar contributed by SCAQMD.

technical risk associated with the proposed concept to be funded. With the leverage achieved by seeking other sources of funding through cost sharing, the utility customer funding need for this effort may be decreased.

**J. Question 10: What Additional Priority Program Areas For Research and Education Should be Added to Those Outlined in the UC Proposal?**

**PG&E RESPONSE:**

While PG&E does not propose additional priority program areas for research and education at this time, PG&E believes that the Institute, in consultation with its advisory group, should maintain flexibility in its research and educational missions in order to adapt to the dynamic climate and energy markets. The three-year program reviews cited above should provide the opportunity to add additional programs, if agreed upon by the Steering Committee.

The Institute as proposed appears to be aimed at doing basic research to better understand the impacts of climate change as well as engaging in a broad outreach program to help cause societal changes that will stem the current course of climate change. While these are important, PG&E believes that the Institute must take a much more focused approach as described in our response to question 5. A vital element that is not included in the proposal is a mechanism that provides a clear application and technology pathway to make the most of the research results and outreach, particularly in the area of forecasting and mitigation of climate impacts on utility infrastructure and facilities.

Ultimately utilities like PG&E will want to use the work of the Institute and others to adapt our equipment, systems and operations to function in conditions that may be very different from those that we operate in today. Many infrastructure investments will be required in the coming world and are likely to require massive capital investments. Utilities and the financial community make decisions on these investments

based on proven engineered solutions based on risk analysis, not research results.

Accordingly, the Institute should include a function that provides a clear pathway for translating the basic research into specific proposals for adaptive change including risk mitigation, and economic analysis of specific mitigation actions, e.g. additional “steel in the ground.”

To do this effectively the Institute should include a separate “Adaptation Board” as part of the Institute’s governance and structure. The Adaptation Board should have significant authority in prioritizing the research and outreach functions of the Institute to ensure that it is focused on producing results that most readily support utility decision making and facilitate rapid adaptive change. To be effective, the Adaptation Board would need to include participation by a comprehensive spectrum of stakeholders; including the utilities who will have to implement the changes, the manufacturers who will have to create different products, the regulators who must authorize implementation and cost recovery; and the customers who will have to pay for the work of the Institute’s research and the changes that flow from it.

**K. Question 11: Should CICS be Expanded to Include Participation by Other Public or Private Institutions?**

PG&E RESPONSE:

Yes. As we stated in our response to Question 1, we believe California possesses some of the richest intellectual capital in the world within its public and private institutions. We recommend that the Commission expand the Institute to ensure participation from all California institutions such as the California State universities and other private institutions.

**L. Question 12: If Research Conducted by the Institute Results in Profitable Technologies or Patents, Should Some Portion of the Profits be Used to Reimburse Ratepayers for the Cost of the Research? If So, How Should This be Structured?**

PG&E RESPONSE:

Yes. There are a number of options for ensuring that customers receive direct benefits as a result of the Institute's research. For example, assuming that the Institute retains a share of revenues received as a result of licensing or selling the technology that results from its research, then the Institute could be required to share its revenues or pay royalties to the utilities whose customers have funded the Institute. In turn, under traditional CPUC ratemaking, the royalties received by the utilities on behalf of their customers would be credited to those customers in their utility rates.

In addition, the Institute should be required to grant the utilities the right or license to use any technology or information developed by the Institute free of charge, on behalf of the utilities' customers and subject to the supervision of the CPUC. Likewise, if the Institute licenses or transfers its technology to third parties, the Institute could retain a license to use the technology for free, and assign that license to the utilities for their use for the benefit of their customers, subject to CPUC regulation of the development and disposition of the licensed technology.

The Commission also could require that the utilities on behalf of their customers retain all or partial ownership rights in any technology or information developed by the Institute, subject to the supervision of the CPUC regarding the licensing and commercialization of the technology by the utilities or the Institute. In order to incent the Institute to help commercialize the technology, the Institute could be given a right to share in a portion of the revenues derived from the commercialization.

In addition to these options, another approach is to conceive of the Institute as a long-term center of innovation and R&D on climate change and solutions, and set up an institutional fund using a percentage of the royalties collected by the Institute from profitable patents and licenses. In such a case, the funds contributed by utility customers would be considered "seed money" toward developing a self-sustaining Institute requiring minimal or no utility customer funding in the long-run.

PG&E recommends that, at a minimum, the utilities be granted free licenses to

use the technology on behalf of their customers, as well as a reasonable royalty interest in profits and revenues received by the Institute from third parties. These options would provide practical, proven commercial and legal mechanisms for achieving the dual objectives of ensuring that utility customer receive a direct “return” on their investment in the Institute, while also ensuring that the Institute is appropriately incented to commercialize the results of its research at the earliest possible time.

#### **IV. CONCLUSION**

PG&E shares the excitement and the urgency of the Commission and the University of California in evaluating the “vision” behind the proposal for the Institute. We also recognize that the “perfect” can be the enemy of the “good” in implementing such a vision. We look forward to working with the Commission, the University of California, and other stakeholders to turn this vision into a practical, balanced and working reality.

Respectfully Submitted,  
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Dated: November 2, 2007

## CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of **“OPENING COMMENTS OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E) ON PROPOSED CALIFORNIA INSTITUTE FOR CLIMATE SOLUTIONS”** on the parties listed in the official service list for R.07-09-008 by

- transmitting an e-mail message with the document attached to each party on the official service list providing an email address; or
- by first-class mail, postage prepaid, to each party on the official service list not providing an email address.

Executed on November 2, 2007, at San Francisco, California.

\_\_\_\_\_  
/s/  
MARTIE L. WAY

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Order Instituting Rulemaking to establish the California Institute for Climate Solutions.	Rulemaking 07-09-008 (Filed September 20, 2007)
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